Déjà vu or something new? The adaptation concept in the climate change literature

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A B S T R A C T

This paper reflects on the resurgence and meaning of the adaptation concept in the current climate change literature. We explore the extent to which the early political economic critique of the adaptation concept has influenced how it is used in this literature. That is, has the current conceptualization been enriched by the political economic critique of the 1970s and 1980s and thus represent something new? Or is the concept used in a way today that echoes previous debates; that is, is this a déjà vu experience? To answer this question, we review the early political economic critique of the natural hazards school’s interpretations of vulnerability and adaptation. We then examine the revival of the adaptation concept in the climate change literature and discuss its main interpretations. For the purposes of this paper, the climate change literature encompasses the four IPCC reports and adaptation-focused articles in four scholarly journals: Global Environmental Change, Climatic Change, Climate and Development, and Mitigation and Adaptation Strategies for Global Change. Our content analysis shows the dominance (70%) of “adjustment adaptation” approaches, which view climate impacts as the main source of vulnerability. A much smaller percentage (3%) of articles focus on the social roots of vulnerability and the necessity for political-economic change to achieve “transformative adaptation.” A larger share (27%) locates risk in both society and the biophysical hazard. It promotes “reformist adaptation,” typically through “development,” to reduce vulnerability within the prevailing system. We conclude with a discussion of continuity and change in the conceptualization of adaptation, and point to new research directions.

1. Introduction

The attention given to the concept of adaptation in the current climate change literature is nothing less than extraordinary. It is extraordinary in at least two ways. First, the sheer number of articles on the topic is impressive. The word adaptation comes up a lot in the titles, key words, and abstracts of climate change journal articles. Second, to a political ecologist, all this interest is surprising given the relative abandonment of the concept some 30 years ago when it was widely criticized for its theoretical deficiencies. In fact, political ecology cut its teeth, or as Paul Robbins would probably say, it sharpened its hatchet, in the 1970s on the social theoretical critique of the adaptation concept in the cultural ecology and natural hazards literatures (Robbins, 2004, 40). Political economists jettisoned the adaptation concept, along with other ecological notions like niche and carrying capacity, because of their emphasis on rational and fine-tuned adjustments by society to environmental conditions like flooding, drought, and other so-called “natural hazards.”

The adaptation concept has had a great comeback in recent years, particularly in the climate change literature. Beginning with the second but especially the third climate change assessment report of the Intergovernmental Panel on Climate Change (IPCC, 2001), climate experts have given considerable attention to adaptation. Up until that time, the scholarly and policy efforts focused on the mitigation of climate change. But the recognition that some climate change had already occurred led the IPCC and others to consider the adjustments that society had made or might make to reduce its vulnerability to existing climate change and variability (Kates, 2000; Schipper, 2006). A second reason for the growing interest in adaptation relates to the political failure of climate change mitigation efforts. Following the refusal of the USA in 2001 to support the greenhouse gas emission goals of the Kyoto Protocol, “adaptation emerged as the only viable option for furthering climate change policy” (Schipper, 2009, 364). As a result of this broad acceptance of adaptation as a scholarly and policy priority, the climate change adaptation literature has boomed in recent years. A staggering 85% of the articles published in Global

Global Environmental Change, Climatic Change, Climate and Development, and Mitigation and Adaptation Strategies for Global Change. Our content analysis shows the dominance (70%) of “adjustment adaptation” approaches, which view climate impacts as the main source of vulnerability. A much smaller percentage (3%) of articles focus on the social roots of vulnerability and the necessity for political-economic change to achieve “transformative adaptation.” A larger share (27%) locates risk in both society and the biophysical hazard. It promotes “reformist adaptation,” typically through “development,” to reduce vulnerability within the prevailing system. We conclude with a discussion of continuity and change in the conceptualization of adaptation, and point to new research directions.
Environmental Change on the topic of “adaptation” have appeared since 2005. Sixty-five percent of these articles appeared within the last 2 years (2010–2011). This surge in interest in the topic can be explained in part by the establishment of the Adaptation Fund in 2001 during the UNFCC’s Seventh Conference of the Parties held in Marrakesh, Morocco. The fund “finances projects and programmes to help developing countries adapt to the negative effects of climate change” (http://www.adaptation-fund.org). The UNFCC’s conceptualization of adaptation as a response to climate change impacts is a dominant theme in the climate change adaptation literature.

For the purposes of this paper, the climate change literature encompasses the four IPCC reports (IPCC, 1990, 1996, 2001, 2007) and four scholarly journals: Global Environmental Change, Climatic Change, Climate and Development, and Mitigation and Adaptation Strategies for Global Change.1 Our review of this literature centered on those articles in which the word “adaptation” appeared either in the title, abstract, or key words. Fig. 1 shows the number and date of the articles that fulfilled these search criteria in each of the journals since 1996, when the concept of adaptation took a foothold in the climate change literature. Prior to 1996, just 3% of the articles in the literature we reviewed emphasized adaptation. The number of climate change journal articles in which adaptation was a central concern more than doubled between 2008 and 2011. Three-quarters of all the adaptation articles in these four journals appeared between 2006 and 2011. The trend supports Jesse Ribot’s observation that the adaptation concept has gone “viral” in recent years (Ribot, 2011).

The objective of this paper is to reflect on the meaning and significance of the adaptation revival. Our main interest is to explore the extent to which the political economy critique of the adaptation concept has influenced how the concept is currently used in the climate change literature. That is, has the conceptualization of adaptation in this literature been enriched by the political economy critique of the 1970s and 1980s and thus represent something new? Or is the concept used in a way today that echoes previous conceptualizations and debates? That is, is this a déjà vu experience? To answer this question, we focus on the natural hazards school’s interpretation of adaptation, which has had the greatest impact on the climate change literature. Other strands of adaptation thinking in cultural and human ecology (Brookfield, 1973; Butzer, 1980a,b, 1990; Denevan, 1983) have not been as influential (Janssen et al., 2006, 248) despite some important social theoretical similarities with the hazards school’s approach to adaptation.2

In the third section, we will examine the revival of the adaptation concept in the climate change literature and discuss its main interpretations. In the final section, we present the results of the literature review that will help us answer the overarching question: Do the prevailing conceptualizations of adaptation in the climate change literature suggest déjà vu or something new?

2. The hazards and political economic conceptualizations of adaptation in the 1970s and 1980s

As in the current climate change literature, the 1970s/1980s discussions of adaptation invariably involved discussions about the relation among hazards, risk and vulnerability. The natural hazards school emphasized the biophysical risk (e.g. drought, hurricanes) and its effects (e.g. production failure, flooding) on society. In contrast, the political economy approach viewed risk as a

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1 The journals are characterized by their emphasis on the human dimensions of global environmental change, their publication of social science perspectives on global change issues, and by the interest of their editorial boards in the adaptation question (Liverman, Personal communication, February 22, 2012).

2 Leslie Head highlights some of the continuities and differences between early human and cultural ecological notions of adaptation and their current uses. She sees a “retrofitting” of older conceptualizations in contemporary uses and points to four areas where this rethink shows some potential (Head, 2010). Karl Zimmerer’s assessment of the different uses of ecological concepts in human and cultural ecology offers fertile ground for reflecting on the heritage of the adaptation concept in the contemporary climate change literature (Zimmerer, 1996).
2.1. Adaptation as “purposeful adjustment” in the natural hazards literature

The dominant view on adaptation in the 1970s hazards literature is well represented in the book *The Environment as Hazard*, co-authored by Ian Burton, Robert Kates, and Gilbert White that appeared in 1978. The book summarizes the results of comparative research on natural hazards and disasters around the globe undertaken between 1968 and 1976. The authors’ goals were largely pragmatic – to share the lessons learned from their research in a way that would “remedy serious deficiencies in hazard management at national and international levels” and ultimately benefit “those who are at risk from natural hazards (Burton et al., 1981, pp. 287–288). The critiques leveled at this work did not seek to diminish these laudable goals. Rather, they focused primarily on the conceptualization of risk, vulnerability, and adaptation, and raised questions about the efficacy of the authors’ proposals for reducing vulnerability in light of their analytical framework. The principal focus of the political economy critique of the hazards framework centered on its “simple human ecological model that assumes individual, purposeful behavior” (Watts, 1983a, p. 240). The hazards model as it appears in *The Environment as Hazard* is illustrated in Fig. 2. Within this framing, hazards are shown to be a negative outcome of the interaction between (separate) natural and social systems whose impacts (e.g. damages) society seeks to diminish through its “responses.” These responses are theorized in cultural ecological terms as “incidental and purposeful adjustments,” which become “adaptive” solutions through their habitual implementation. Burton, Kates and White argue that the most common adjustments to hazards are “preventive adjustments” that seek to reduce damages by “alter[ing] the vulnerability of society to the hazardous event by curbing it or by designing human activities to prevent its injurious effects (Burton et al., 1978, p. 48; emphasis in original). The activities that are recommended to minimize damages are technocratic and top-down in nature, such as establishing early warning systems, building higher levees, designing better buildings, or developing new crop varieties. This emphasis on biophysical risks and technical solutions to minimize losses seeks to preserve the existing system by strengthening its “absorptive capacity” (Burton et al., 1978, pp. 41–42). Pelling calls this adaptive approach “resilience adaptation” because it seeks to “allow existing functions and practices to exist” (Pelling, 2011, p. 50). This is a politically conservative approach to adaptation that is attractive to aid donors and governments because it does not seriously challenge the status quo.

A key question asked by Burton et al. is: “How do people choose the degree of risk they will bear and the adjustment they will make?” (Burton et al., 1978, p. 49). In answering this question, the authors populate their stimulus–response model with purposeful individuals who choose from a range of possible adjustments based on economic calculations and subjective evaluations, both of which are linked to a so-called “satisficing” rationality. By way of example, they present the hypothetical decision-making process of a fisherman who must decide whether to sit out a tropical cyclone warning along the coast or move his boat inland to avoid potential damages. The assorted “pay-off matrices” illustrate how “a ‘rational’ fisherman might analyze his choice to ‘sit it out’ or evacuate depending on his knowledge, beliefs and values” (Burton et al., 1978, p. 51). In short, cost/benefit analysis and imperfect knowledge of hazardous events influences the purposeful adjustment process.

The value of their comparative work is to show how the same event (e.g. a cyclone) can have dramatically different consequences. A comparison of the effects of the 1972 Tropical Storm Agnes in the United States in which 250,000 were safely evacuated from Wilkes-Barre, PA, and the 1970 cyclone that hit Bangladesh and left 225,000 people dead shows a number of common features and one major difference—”to be poor as a nation or a person is to be particularly vulnerable” (Burton et al., 1978, p. 12). This attention to poverty, however, does not receive further scrutiny. It is just one of many social and technological variables that make up a long list of proximate factors that make some countries and social groups more prone to disasters than others. The problem with this proximate factors approach is that it lacks theoretical coherence. There is no analysis of the causal structures and social processes that make some populations more or less vulnerable. In the absence of a “workable theory of social process” (Emel and Peet, 1989, p. 64), Burton, Kates, and White conclude that the conjuncture of 3 “forces” explain the rising number of disasters: population growth and the spread of people to places that are vulnerable to hazards; a rise in the number of catastrophic hazards; and a greater exposure to natural hazards in developing countries that are in a precarious transition between “tradition” and “modernization” (Burton et al., 1978, p. 16).

In summary, Burton et al.’s analytical framework for the study of hazardous environments is based on a simple voluntarist model in which hazards emerge from the interaction between discrete natural and social systems that are populated by more or less rational actors who make choices to settle in some areas that expose

![Fig. 2. The natural hazards stimulus–response model reproduced from The Environment as Hazard. Reproduced with permission from Guilford Publications.](image-url)
them to extreme natural events. A hazard is defined as the “risk encountered in occupying a place” where extreme natural events are common (e.g. flooding, drought) (Burton et al., 1978, p. 19). Vulnerability is associated with the ability of an individual, social group, or country to cope with specific risks (Burton et al., 1978, p. 17). “Hazard proneness” is mediated by the interaction of technology, nature, and society via purposeful adjustments (Burton et al., 1978, p. 18). Technological innovations and government policies that reduce the potential losses from living in hazardous environments are common preventive adjustments. The adaptability or “absorptive capacity” of a population is a function of its mix of purposeful adjustments (Burton et al., 1978, pp. 41–42). Proximate factors such as technology, location, income levels, and institutions dominate the analytical framework and drive the adjustment process.

An alternative framing of hazard vulnerability and adaptation emerged at the same time as The Environment as Hazard appeared in print. The questions asked by political economists differed sharply from those that issued from the Burton–Kates–White model. The hazards school asked, How do people choose the degree of risk they will bear and the adjustment they will make? In contrast, political economists asked, How is vulnerability shaped by political economic processes and the social relations of production in which constraint rather than choice limits adaptive capabilities? While the natural hazards school located risk in the hazard, political economists focused attention on the underlying sources of vulnerability that exposed people to a wide range of social as well as biophysical stressors (Marston, 1983).

2.2. The political–economy critique of adaptation as “purposeful adjustment”

The political economic critique of the hazards analytical framework focused on four areas: (1) the voluntarist conceptualization of society in which social process is reduced to the choices of individual decision makers; (2) the emphasis placed on proximate factors (e.g. unsafe conditions) rather than the root (social-structural) causes of risk; (3) the inordinate emphasis placed on the biophysical dimensions of so-called natural disasters to the detriment of their social origins; and (4) the conservative political implications of viewing adaptation as an adjustment process to the prevailing political–economic system. In summary, political economists viewed the natural hazards school’s attention to proximate factors and technocratic interventions as palliative measures that did not address the social structural causes of vulnerability. This social theoretical critique appears in the work of Hewitt (1983), O’Keefe et al. (1976), Susman et al. (1983), Torry (1979) and Watts (1983a, 1983b). The writings of Michael Watts best convey these core political economic critiques.

Watts’s research aimed to understand the origins of famine in northern Nigeria. His work seeks, in particular, to explain the paradox of hunger in rural Hausa communities where households have access to land and possess an “adaptive capacity” in the form of sophisticated and time-tested agro-ecological knowledge, institutions and technologies suited to their hazardous environment, particularly drought. But this adaptive capability, he argues, was eroded by the processes of European colonialism and the new social relations of capitalist production, which modified precolonial “institutions, mechanisms and practices...[that had] provided a measure of security and buffered households from the worst effects of variability in rainfall and food supply” (Watts, 1983a, p. 249). In short, Watts argues that Hausa farmers were “conceptually prepared” to cope with drought but that the transformation in social, economic, and political relations wrought by colonialism and capitalism undermined their ability to do so. This adaptation failure he calls “structural maladaptation,” which he describes as the “inability of some peasants to respond—in other words, to reproduce themselves—under conditions of environmental risk that characterize[s] the transformation of the social relations of production in Hausaland” (Watts, 1983a, p. 246).

Watts’s theorization of (mal)adaptation to hazards builds upon a historical materialist perspective in which he traces the generation and appropriation of surplus value within different social formations. He discusses in great historical detail the dynamics of surplus appropriation and redistribution within the precolonial Sokoto Caliphate and how these changed under British colonialism (Watts, 1983b). During the precolonial era, rural producers enjoyed a measure of subsistence security thanks to multi-scale redistributive mechanisms and entitlements. Watts describes the inner workings of this precolonial moral economy in which social relations (kinship ties, communal work groups), institutions (interest free grain loans from the sarkin nama (king of farming), and the obligation of village and district heads to distribute food during famine periods collectively reduced hazard vulnerability. Colonial capitalism changed the conditions of production in a way that heightened vulnerability to drought and food shortage. Taxation, export commodity production, and the monetization of the economy rechanneled the flow of surplus value to colonial agents (merchants; the colonial state) and placed unprecedented stress on rural communities in which “the old responsibilities and obligations became less binding, communal work largely disappeared, and the extended family became less embracing and hence increasingly incapable of buffering individuals in crisis” (Watts, 1983a, p. 251). The adaptive capability of rural producers changed as the old support networks weakened and market relations exposed households to new conditions marked by adverse terms of trade, debt, poverty, and reduced consumption levels.

In summary, Watts’s risk analysis situates social vulnerability within political economic processes in which “hazards had been redefined by the transformation in the social relations of production” (Watts, 1983a, p. 252; emphasis in original). People who had previously been able to cope with environmental variability were “increasingly vulnerable to even small variations in rainfall, and the rural poor became “hyper-vulnerable” (Watts, 1983a, p. 252).

The contrast between Watts’s theorization of adjustment and adaptation and that of Burton, Kates and White could not be more striking. In contrast to the atomistic world of individual decision makers who adapt to natural hazards through a “satisficing” process, Watts’s world is peopled by individuals whose ability to cope with and ultimately adapt to hazards is a social process in which political–economic dynamics and social relations determine their “adaptive capability.” The fisherman’s choice model highlighted in The Environment as Hazard describes a “rational” process in which the fisherman “analyzes his choices in many ways depending on his knowledge, beliefs, and values” (Burton et al., 1978, p. 51). For the Hausa peasant farmer, “hazard response is... contingent upon the social context of the responding unit and upon their situation in the productive process” (Watts, 1983a, p. 256; emphasis in original).

Watts’s insistence that any discussion of adaptive capability must be linked to causal structures of vulnerability contrasts with the proximate factors approach that dominated hazards research in the 1970s. Similar “radical” thinking informed the work of O’Keefe, Susman, and Wisner in their publications that emphasized the socio-economic dimensions of so-called natural disasters (O’Keefe et al., 1976; Susman et al., 1983). Their primary contribution to advancing the hazards literature was to take the naturalness out of natural disasters. Building upon underdevelopment theory pioneered by Latin American scholars, they explained hazard vulnerability as the outcome of a “process of marginalization” (O’Keefe et al., 1976). Their theory of marginalization explained “disaster proneness” in “underdeveloped” countries as stemming...
from the “expropriation of surplus value” by foreign and domestic elites from the rural poor (Susman et al., 1983). Impoverished peasants frequently migrated to cities in search of better livelihoods. The new urban poor were typically confined to living in areas and housing that were highly vulnerable to hazards like floods and earthquakes. When these hazards hit, the poor were its major victims. While the hazards themselves may have been natural, there was nothing natural about these disasters. When an earthquake hit Guatemala City in 1976, thousands died, mainly poor people living in steep ravines along fault lines. High-income households living in earthquake-proofed housing were barely affected by the quake. Underscoring the social as opposed to the natural origins of the disaster, Guatemala City survivors referred to the earthquake as a “classquake” (O’Keefe et al., 1976, p. 566).

Another political economic critique of the adaptation concept in the natural hazards literature focused on its implicit political support of the status quo (Susman et al., 1983, p. 279). For the hazards school, adaptation involved a series of human adjustments to extreme natural events. Attention focused on the hazard, its real or potential damages, and how these might be reduced through better planning. Preventive adjustments aimed to buttress the existing “human system” by improving its ability to “absorb the effects of extreme environmental fluctuations” (Burton et al., 1978, p. 42). Building “absorptive capacity” through purposeful adjustments was the main goal. Political economists viewed these adjustments as inadequate measures because they did not address the social structural causes of vulnerability. Thus, if the causes of hazard vulnerability lay rooted in the political–economic system, then it was the system that had to change. If that was the case, then what was the point of adapting to a system that by its very nature systematically produced vulnerability? From the political economy perspective, the adaptation concept seemed to inhibit rather than to advance understanding of the challenges that lay ahead in reducing social vulnerability. The term “maladaptation” seemed to better capture the structural vulnerability of some social groups to socio-natural events. As a result, many geographers abandoned the adaptation concept because of its failure to address the political economy and politics of maladaptation.

The concept of maladaptation challenged core assumptions of the hazards school’s conceptualization of adaptation. These assumptions included a framing of nature–society relations in structural functionalist terms that drew upon general systems theory and biological ecology. A core assumption of systems thinking views society and nature as being in a general state of equilibrium that is maintained by self-regulating homeostatic responses. Similar to prevailing cultural ecological models (Denevan, 1983; Nietzsche, 1973), hazards thinking was functionalist “in the sense that institutions and behaviors emerge as rational; their utilitarian purpose is to fulfill prescribed functions with regard to the maintenance of populations in a human ecological niche, that is to say with survival. Persistence, then was a measure of adaptation” (Watts, 1983a, 237, emphasis in original). Perturbations like drought compel “society” to make adjustments that will allow it to return to some previous desirable state. In this way, the process of adaptation is a teleological one in the sense that “adaptive processes are framed by their survival function; they are defined in terms of their results” (Watts, 1983a, 237).

In addition to these epistemological and theoretical critiques, political economists focused on the tendency in hazards research to naturalize risk by locating it within the hazard itself. As Hewitt stated, “hazards are taken as natural events that destabilize or violate ordinary life and relations to the habitat (Hewitt, 1983, 11; emphasis in original). Such framings worked to legitimate contingent social processes and for sidestepping the politics of resource access, control and management (Robbins, 2004, 36). The implications for policy were apparent. As long as “the sense of causality or the direction of explanation still runs from the physical environment to its social impacts” then technocratic rather than political solutions will prevail (Hewitt, 1983, 5; emphasis in original).

In summary, by the early 1980s, there was a great divide between political economists and hazards scholars engaged in research on hazard vulnerability. The main source of contention centered on how hazard vulnerability was theorized. The hazards school sought explanation in a host of proximate factors and processes. It focused attention primarily on the impacts of hazards on society, especially their human and monetary costs. In contrast, political economists focused more on the social processes that produced vulnerability. Strongly influenced by historical materialist perspectives, they focused on how changes in the social relations of production and the appropriation of economic surpluses reduced the capacity of some social groups to cope with hazards, which resulted in their heightened vulnerability. The solution to the consequent crises of social reproduction was to transform the political economic system. This transformation might involve the restructuring of political economies at multiple scales. The goal of political economic analysis was to illuminate the multi-scale processes that made people vulnerable in the first place. Thus, the intellectual rift between political economists and natural hazards scholars was also an ideological one. The hazards school did not challenge as much as tweak the prevailing political economic system through an adjustment process. The political economy view, in contrast, indicated that it was the political economic system that needed to change. In short, the hazards school viewed adaptation as adjustment, the political economy perspective viewed adaptation as transformation.

Discussions of both adjustment and transformation became muted for a decade after the heated debate of the late 1970s and early 1980s. This did not reflect a resolution of the debate. Instead, this was, in part, a reflection of the radical geography perspective becoming “more sober and less combative” (Peet and Thrift, 2001, 7) and, in part, the political economy perspective becoming more readily accepted in Geography and other disciplines. Work on hazards did not disappear completely in this period. Some authors, among them Liverman (1990, 1994) and Kate (1987) kept hazards analysis central to global environmental change discussions. They did so with analytical tools gained from the hazards/political economy debates of the late 1970s/early 1980s. Their attention to social and political–economic conditions that contribute to vulnerability was an important outcome of these discussions. This heightened sensitivity to socially-mediated vulnerability and adaptation were hallmarks of the first edition of Blaikie et al.’s At Risk: Natural hazards, people’s vulnerability, and disasters, that was notable for its “pressure and release” model that explicitly focused on political economy as the explanation for varied vulnerability and adaptive capacity (Blaikie et al., 1994). That leads to the question we address in this paper: To what extent did these ongoing discussions influence the understanding of the adaptation concept in the current climate change literature?

3. The adaptation concept in the climate change literature

Two things can immediately be said about the adaptation concept in the climate change literature: first, it is a very popular topic, and second, it means different things to different people. Its popularity is evident in the four journals we examined for the years 1996–2011. Of the 558 articles in which “adaptation” was a principal theme, 68% appeared in the last 5 years (2007–2011). Our
literature review also confirms Mark Pelling’s and Leslie Head’s observations that the term “adaptation” is very “slippery” in the sense that the concept is broadly interpreted (Pelling, 2011, pp. 8–13; Head, 2010; Füssel, 2007). Despite the diversity of definitions and interpretations, the IPCC’s “impacts-led” (also called “end-point” or “outcome”) conceptualization of vulnerability and adaptation dominates most discussions (Füssel and Klein, 2006; Kelly and Adger, 2000). The impacts-led approach is similar to the hazards school’s view of adaptation as adjustment.

3.1. The adaptation concept in the IPCC reports

The first IPCC assessment report (1991) did not address adaptation at all. It focused exclusively on climate change mitigation research and policies aimed at reducing GHG emissions. Adaptation to climate change only became a concern in the IPCC’s 1996 Second Assessment Report in which “options for adaptation” are sparsely but systematically discussed within the thematic chapters of Volume 2. For example, the chapters on the impacts of climate change on forests, rangelands and health all devote a half page to discussions of adaptation. Most of the proposed adaptation options are technical but the health chapter emphasizes the importance of basic human development needs such as “improved primary health care for vulnerable populations” (IPCC, 1996, pp. 579–580). Its authors further suggest that more transformational changes might be in order based on “acceptance of the Precautionary Principle as the foundation of policy response. This, in turn, would suggest some fundamental, and therefore difficult, reorientations of social, economic, and political priorities” (IPCC, 1996, p. 580; emphasis added). This radical proposition is muted, however, in the only chapter of the report that is devoted exclusively to adaptation.

Chapter 26 of the 1996 report focuses on technical guidelines for assessing climate impacts and adaptations. These guidelines are presented as steps to follow in determining appropriate adaptation responses. The seven “Steps in Evaluation of an Adaptation Strategy” are worth dwelling on since they illuminate the adaptation process (Table 1).

The first step, defining the objectives, is by nature highly political since determining the appropriate adaptive actions will be influenced by how the problem is framed at the outset. So how do the authors frame the problem? The second step indicates that the problem is circumscribed by “the possible impacts of climate variability or change on the exposure unit” (IPCC, 1996, p. 832). That is, hazard vulnerability is limited to the climate hazard itself. The social origins of risk are missing from this picture.

The third step recommends that adaptation options should be investigated by experts through field research. The authors suggest that a variety of practices may be relevant but they highlight six types of adaptation strategies as if these represent best practices. The adaptation strategies shown in Fig. 3 are drawn directly from Burton, Kates and White’s “Choice Tree of Adjustment” presented in The Environment as Hazard (Fig. 4). In short, a direct line can be drawn between the natural hazards school with its emphasis on purposeful adjustments to the early IPCC conceptualization of the adaptation process.

Table 1

| 1. Defining the objectives |
| 2. Specifying the climatic impacts of importance |
| 3. Identifying the adaptation options |
| 4. Examining the constraints |
| 5. Quantifying the measures and formulating alternative strategies |
| 6. Weighing objectives and evaluating tradeoffs |
| 7. Recommending adaptation measures |

Six types of strategy for adapting to the effects of climate have been identified:

- **Prevention of loss**, involving anticipatory actions to reduce the susceptibility of an exposure unit to the impacts of climate
- **Tolerating loss**, where adverse impacts are accepted in the short term because they can be absorbed by the exposure unit without long-term damage
- **Spreading or sharing loss**, where actions distribute the burden of impact over a larger region or population beyond those directly affected by the climatic event
- **Changing use or activity**, involving a switch of activity or resource use to adjust to the adverse as well as positive consequences of climate change
- **Changing location**, where preservation of an activity is considered more important than its location, and migration occurs to areas that are more suitable under the changed climate
- **Restoration**, which aims to restore a system to its original condition following damage or modification due to climate.

Step 4 states that some of these adjustment options may conflict with “prevailing social norms.” But steps 5 and 6 suggest that, by following a rational technocratic approach, that adaptation benefits can be attained and measured through conventional quantitative measures. Step 7 is the ultimate moment when scientific experts speak to policy makers. This final guideline states that “the results of the evaluation process should be compiled in a form that provides policy advisors and decision makers with information on the best available adaptation options” (IPCC, 1996, p. 832).

In summary, the 1996 IPCC report defines adaptation in relation to climate change impacts. The official definition, which is buried on p. 831 of the report, is unequivocal in this narrow conceptualization of vulnerability and thus adaptation.

Adaptation is concerned with responses to both the adverse and positive effects of climate change. It refers to any adjustment—whether passive, reactive, or anticipatory—that can respond to anticipated or actual consequences associated with climate change. It thus implicitly recognizes that future climate changes will occur and must be accommodated in policy (IPCC, 1996, p. 831).

Although this definition does not exclude socially-mediated vulnerability, the emphasis given to responding to “the effects of climate change” indicates at the discursive level “the sense of causality or the direction of explanation still runs from the physical environment to its social impacts” (Hewitt, 1983, p. 5; emphasis in original). The fact that other, non-climatic sources of vulnerability are not on the adaptation agenda may be linked to the science–policy process in which the IPCC serves as an intermediary between scientists and policy makers.

The IPCC reports reflect a consensus driven process that seeks to produce state of the art knowledge on climate change dynamics that is relevant to policy makers (Grundmann, 2007, pp. 415–416). Located at the interface between science and policy, it can be productively viewed as a boundary organization that influences...
science and policy "through practices such as problem closure and framing" (Forsyth, 2003, p. 142). The key question then is translational. How does the IPCC evaluate the issues of vulnerability and adaptation to risk as discussed in the climate change literature? How do these assessments frame policy discussions? Problem framing that highlights the political–economic drivers of poverty (e.g., unfair trade practices) might not be well received by governments that have a stake in conducting business as usual. Thus, it may be politically expedient, if not strategic, to keep difficult social, economic, and cultural dimensions of vulnerability and their policy implications off the agenda since they will likely be resisted by governments that view political–economic change as a threat to the status quo. In short, the IPCC's 1996 conceptualization of climate change adaptation in terms of proximate factors and technocratic solutions represents a politically conservative framing of the problem at the science–policy interface. But boundary organizations can also play a progressive role, which means that a reframing of adaptation as a social and political challenge, as much as a technocratic problem, is always possible (Pelling, 2011, p. 67).

The IPCC's 2001 Third Assessment Report gives much greater attention to adaptation than the two previous reports. The authors argue that this expanded focus on adaptation is warranted by its importance in climate impact and vulnerability assessments as well as for developing response strategies to climate change and variability (IPCC, 2001, p. 881).

The adaptation concept is linked for the first time in the 2001 report to a broader understanding of vulnerability. There is recognition, for example, that "non-climatic forces and conditions" can shape a population's vulnerability. The authors note, with reference to the work of geographers Diana Liverman and Tom Downing, that "because vulnerability and its causes play essential roles in determining impacts, understanding the dynamics of vulnerability is as important as understanding climate itself" (IPCC, 2001, p. 894). This recognition of the social as well as the biophysical dimensions of vulnerability is significant. Even the definition of adaptation in the 2001 report suggests that adaptation involves a combination of adjustment and transformation, what we describe below as "reformist adaptation." In 2001, the IPCC defines adaptation as

"adjustments in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects or impacts. It refers to changes in processes, practices, and structures to moderate potential damages or to benefit from opportunities associated with climate change" (IPCC, 2001, p. 879; emphasis added).

However, like the 1996 report with its emphasis on both climate-related stimuli and the need for "fundamental and therefore difficult reorientations of social, economic, and political priorities" (IPCC, 1996, p. 580), the idea of adaptation as transformation gets quickly watered down in the 2001 assessment. Fig. 5 illustrates the simple stimulus–response model in which the adaptation process is ultimately reduced to the selection of the appropriate adaptation type (e.g., reactive, anticipatory). "Non-climatic forces and conditions," which we interpret to mean social contextual relations that affect vulnerability, are relegated to an undersized box in the margin of the diagram. This marginalization of the wider political economy stands out in the examples of the various adaptation actions discussed in the report. These actions are invariably technological in nature. Thus, much emphasis is placed, for example, on developing new crop varieties in Africa rather than, for example, reforming food aid policies that undermine local and regional food security (Thurrow and Kilman, 2010).

The "determinants of adaptation" are presented in checklist fashion with emphasis given to economic resources, technology, information and skills, infrastructure, institutions, and equity (IPCC, 2001, pp. 895–897). The links between poverty, the distribution of resources, and empowerment are not addressed. The word "power" only appears once and it is a local matter (IPCC, 2001, p. 902). In short, adaptation always seems to take place in relation to a list of proximate factors that can be more or less addressed without upsetting the social–political order.

In fact, the authors of the IPCC, 2001 report seem to go to great lengths to downplay the social structural causes and politics of vulnerability and adaptation. For example, political conflicts and economic inequalities are summarily described as "political and institutional inefficiencies" (IPCC, 2001, pp. 896–897). Although the authors of this report are well aware of the root causes of vulnerability (Kelly and Adger, 2000), the consensus decision making process within the confines of the IPCC leads to watered down, depoliticized prose as in this description of Michael Watts' political economic analysis of the erosive effects of colonialism and capitalism on the Hausa's adaptive capabilities.

"Acceptance of western economic ideals coupled with increasing and rapid development may reduce the capacity of traditional societies to adapt" (IPCC, 2001, p. 898).
A distortion of such proportions indicates how the unbalanced focus on climate stimuli and proximate factors diverts attention from the underlying social and political relations that make people vulnerable in the first place. At best, the IPCC vaguely locates the “causes” of vulnerability in “socioeconomic systems” and prescribes a generic form of “sustainable development” as a broad-spectrum cure-all (IPCC, 2001, p. 879). The IPCC’s tendency to make the political–economic dimensions of vulnerability and adaptation disappear from its analysis and to emphasize technocratic adjustments to climate impacts evokes an environmental determinist view of adaptation (Denevan, 1983, p. 405; Liverman, 2006, p. 288; Ribot, 2011).

The 2007 Fourth Assessment Report retains the same concepts and definitions of adaptation as the 2001 report. Adaptation is defined as

Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished, including anticipatory, autonomous and planned adaptation (IPCC, 2007, p. 869).

In general, the fourth assessment offers the most systematic and coherent view of the social contextual dimensions of vulnerability and adaptation. A section on differential adaptive capacity discusses the multiple stresses and socioeconomic processes that result in adaptive inequalities. Another section on the barriers and limits to adaptation echoes Watts’s observations on the paradox of (mal)adaptation in societies where adaptive capability is strong but implementation is weak.

Notwithstanding its many candid assessments such as “Technological solutions...are not sufficient to address the underlying social drivers of vulnerabilities to climate” (IPCC, 2007, p. 721), the 2007 report falls short in placing the causal structures of vulnerability and adaptation at the center of analysis. As a result, adaptation is still largely viewed as an “adjustment” to reduce vulnerability to climate stimuli. This limited view of adaptation is articulated in the report’s concluding section where the authors state: “Adaptation has the potential to alleviate adverse impacts, as well as to capitalize on new opportunities posed by climate change” (IPCC, 2007, p. 737). That is, adaptation remains a palliative response since the transformation of the “system” does not appear to be an option.

In summary, the conceptualization of adaptation in the IPCC assessment reports has not evolved considerably over the past 20+ years. The similarity of definitions with their emphasis on adjustment to climate stimuli is a major thread running through them. A second thread is the uncritical claim that actions taken to promote “sustainable development” will also enhance adaptive capacity. As the work of Bill Adams and Katrina Brown show, the dominance of “mainstream sustainable development” does not hold much promise for transformative adaptation (Adams, 2008; Brown, 2011).

A third characteristic of the adaptation concept is its general recognition of the importance of “non-climatic forces and conditions” that affect vulnerability and the adaptation process. These dynamics, however, are typically reduced to proximate factors whose causal roots are never theorized. In the end, the emphasis placed on proximate factors and lists of adaptation options begs multiple questions about the framing of the climate change adaptation problem. Many assumptions are left unexamined. For example, the “system” is typically taken for granted, and so are its politics. The IPCC reports are at most reformist in nature. Although they recognize the general importance of socially derived vulnerability, their framing of adaptation draws attention to response rather than causality (Ribot, 2011). The studious avoidance of politics and power relations and the omission of the social science literature on the co-production of science and policy are defining features of this business-as-usual climate change politics.

3.2. The adaptation concept in climate change journals

A content analysis of the climate change literature demonstrates the degree of continuity and change in the conceptualization of adaptation between the 1970s/1980s and the present. We examined 558 articles in four mainstream climate change journals (Global Environmental Change, Climatic Change, Climate and Development, and Mitigation and Adaptation Strategies for Global Change) in which the word “adaptation” appeared in either the title, abstract or in the list of key words. We read and classified each abstract on the basis of the authors’ conceptualization of climate change adaptation. We placed each article in one of three adaptation categories: adjustment, reformist, and transformative. This classification is partly inspired by Mark Pelling’s three adaptation types (resilience, transition, transformation) (Pelling, 2011). We initially tried to place each of the articles into either the adjustment or transformation categories. But it turned out that a large number of the papers fell outside these groupings. It was then that we discovered Pelling’s work and appreciated his conceptualization of a transition category, which we call “reformist adaptation” in our literature review. We define our categories in the following terms.

*Adjustment adaptation* views climate impacts as the major source of vulnerability. It draws attention to responses to climate change
rather than to the social causes of vulnerability. Society is conceived of as the sum of its individual members and governed by a politically neutral and benevolent state. It is assumed to be in a state of equilibrium that is destabilized by climatic perturbations. The purpose of adaptation is to adjust to these new conditions through climate risk management, whose aim is to “return” society to some desirable equilibrium state. Adjustment adaptation is politically conservative in that it seeks to reinforce the status quo.

Reformist adaptation occupies a middle ground between the adjustment and transformative adaptation approaches. The papers in this grouping place more emphasis on the social and political dimensions of vulnerability. By locating risk in society as much as in the biophysical hazard, reformist adaptation seeks to reduce social vulnerability by addressing “vulnerability drivers” and “response capacity” through “development” (McGray et al., 2007; Mears and Norton, 2010). The focus of reformist adaptation ranges from improved intersectoral coordination and public safety nets (Mears and Norton, 2010, p. 32) to the role of local knowledge and institutions in mediating climate change impacts (Agrawal and Perrin, 2009). These approaches are reformist in that they seek to alter the rules that create vulnerability by working within the existing system (Pelling, 2011).

Transformative adaptation emphasizes the importance of understanding the causal structure of vulnerability in different political-economic and environmental contexts as the basis of adaptation planning. The goal of vulnerability analysis is “to identify the active processes of vulnerability production and then to identify which are amenable to redress” (Ribot, 2010, p. 61). These processes can range from local scale social and economic inequalities and lack of representation to insufficient entitlements and unfair trade practices. Society is theorized as socially and geographically differentiated along the lines of class, gender, race, and location, which makes some social groups and places more or less prone to risk. Since vulnerability is the outcome of multi-scale processes, vulnerability reduction must take place at multiple sites. Whether it is in the conference rooms of boundary organizations or through strengthening the livelihoods of ordinary people through representation and political action, transformative adaptation stresses overcoming the social structural barriers to vulnerability reduction. It is synonymous with “political regime change” in the sense that power relations must change if business is no longer to be conducted as usual (Pelling, 2011).

The influence of the IPCC definition of adaptation became quickly apparent in our review of the four climate change journals. Some 70% of the articles conceptualized adaptation as an adjustment to climate stimuli. The topics of these articles ranged from modeling anticipated climate impacts on energy, water, and crop yields to estimating the costs of climate change on public infrastructure and climate-induced migration. According to our scheme, these articles fall within the adjustment adaptation framework. As noted in the previous section, this conceptualization of adaptation as an adjustment to biophysical risk is similar to the Burton–Kates–White model with its emphasis on technical and sectoral adjustments to hazards.

A representative article of this framing is a 2010 piece by Rob Swart and Natasha Marinova called “Policy options in a worst case climate change world.” The premise makes clear that even in the “worst case,” a scenario in which climate impacts are felt beyond the gravest IPCC assessment, that adaptation priorities are a balance between effectiveness/feasibility and the fewest environmental/political risks. Decisions, the article stresses, are to be made largely top down; the closest thing to an acknowledgement of uneven adaptive capacity and vulnerability is in a discussion of “feasibility,” where it is noted that “…there are also social limits to adaptation, determined by definitions and goals of adaptation and cultural barriers” (Swart and Marinova, 2010, p. 540, citing Adger et al., 2009). While the article addresses a “worst case” scenario, it leaves unanswered (in fact, unasked) a key question: worst case for whom?

The idea of adaptation winners and losers, that one group’s “worst case” may be a far better scenario for another group, is encountered in a much smaller number of articles. We placed just 3% of the articles in the transformative adaptation category. These papers emphasized the multiple sources of vulnerability and the need for fundamental social change. A representative paper called for a renewed emphasis on “sustainable development.” Its authors stated: “We argue that fundamental societal transformations are required in order to achieve sustainable development pathways and avoid adaptation funding going into efforts that exacerbate vulnerability” (Eriksen et al., 2011, p. 7). The topics of other articles ranged from access to and control of resources (Brännlund and Axelsson, 2011) and entitlements (Johnson and Krishnamurthy, 2010) to the politics of climate adaptation choices (McEvoy and Wilder, 2012) and their effects on different social groups (Young et al., 2009). These themes recall the emphasis placed on social relations and political economic processes by political economists in the 1970s/1980s. These research foci and related policy recommendations express a vision of adaptation as transformation of the political economy to address the multiple stressors producing vulnerability.

A much larger group of research articles fell within the reformist adaptation category. We initially found it difficult to place these articles in either the adjustment or transformative adaptation categories largely because they seemed to contain elements of both framings. Some 27% of the articles fell into this middle ground. While the articles often dealt with themes quite typical of the adjustment adaptation realm of work, there was a greater openness to changing the rules and decision-making processes around adaptation than simply adjusting to inevitable impacts. That is to say that the approach stressed interventions and adaptations not only to deal with climate change impacts but also with elements of vulnerability that defined and shaped those impacts. Additionally, other articles within this framework dealt with inequalities and vulnerabilities shaped by political economy, much like the transformational realm. The key distinction was that articles within the reformist realm were typified by adaptation that altered rules and decision-making processes, but did not significantly alter the norms and principles that governed the rules (Pelling, 2011, p. 70; citing Krasner, 1983, p. 5). Typical research topics that fit into this category were the co-production of knowledge for climate adaptation (Newsham and Thomas, 2011; Armitage et al., 2011), the influence of social identity in risk perception (Frank et al., 2011), and the behavioral dimensions of adaptive actions (Pelling and High, 2005; Kuruppu and Liverman, 2011). Representative papers in this category often centered on the idea of disaster risk, a concept that seeks to synthesize adaptation and “development” (McGray et al., 2007; Mears and Norton, 2010). Disaster risk reduction focuses on adaptations that disproportionately serve those who are most vulnerable to shocks. We placed them in the reformist adaptation category because, as in Pelling’s conceptual framework, they seek to build adaptive capacity and “implement innovations and exercise existing rights within the prevailing order” (Pelling, 2011, p. 68).

In summary, the content analysis shows the dominance (70%) of the IPCC’s interpretation of adaptation, broadly defined as a process of adjusting to climate impacts. The dynamics of adaptation are vague. The adjustment process is simply equated to a list of adaptation types, which are distinguished by “purposefulness and timing” (IPCC, 2001, p. 883). The listing of various types of adjustments recalls the rational decision making process of choosing among possible adaptation types (e.g. spontaneous, planned). Kelly and Adger describe this type of adaptation assessment as
following a linear “sequence of analyses beginning with projections of future emissions trends, moving on to the development of climate scenarios, thence to biophysical impact studies and the identification of adaptive options” (Kelly and Adger, 2000, pp. 326–327). In this sense, it does not seem like mainstream adaptation thinking has progressed very much from the stimulus–response model presented in 1978 in The Environment as Hazard.

4. Déjà vu or something new?

There is a strong sense of déja vu in reading the IPCC reports and climate change journal articles. The contrasting “adjustment” and “transformation” conceptualizations of adaptation in this literature are reminiscent of the debate between political economists and hazards scholars over the sources of vulnerability. The emphasis of the hazards school on the biophysical hazard and the different types of possible adjustments is similar to the IPCC interpretations of vulnerability as an outcome of climate change impacts (exposure and sensitivity) and adaptation as a mitigating response.

Much like the political economic critique of the hazards school, the critical climate change literature emphasizes the need to broaden the scope of vulnerability reduction to include transforming the social and political conditions that produce vulnerability in the first place (Wisner et al., 2004, p. 89; Ribot, 2010, 2011; O’Brien, 2011; Pelling, 2011). The call for transformative adaptation resonates with the political economic critique of conventional hazards research. In short, it seems to us that there is more déja vu than something new in the adaptation concept in the climate change literature. That said, the presence of a strong reformist strain indicates that something different is emerging in the literature.

One thing that is different is the greater attention given to human agency in creating a more just society. This attention to the capacity of vulnerable social groups to improve their access to resources and entitlements by changing institutions through political action represents something that was absent in the 1970s/1980s. The Marxist-inspired political economy approach to vulnerability emphasized the structural determinants of vulnerability that offered little analytical space for “the creativity of popular activity” (Mamdani, 1986, p. 49, cited by Watts and Bohle, 1993, p. 50). One of the results of this central focus on the social structural causes of hazard vulnerability was to “emphasize people’s weakness and limitations” which contributed to representations of the socially vulnerable as “passive and incapable of bringing about change” (Wisner et al., 2004, p. 14). The tremendous interest in state-civil society relations, particularly the empowerment and enfranchisement of the poor through social movements aimed at securing social and environmental entitlements, has filtered into the climate change adaptation literature. One example of this local politics is the mobilization of forest peoples to maintain access to resources in the context of carbon forestry and other forms of “carbon colonialism” (Bumpus and Liverman, 2011; Beymer-Farris and Bassett, 2012). Another example is the greater attention given to the voices of the vulnerable in environmental policy-making bodies (Forstyh and Walker, 2008), and to representation and accountability in natural resource decentralization policies (Chhatre, 2008; Ribot, 2010).

A second new development builds on post-structural theoretical approaches to nature–society relations and environmental politics. The influence of science and technology studies are evident in the writings of Demeritt (2001) and Forstyh (2002) in their discussions of the role of boundary organizations such as the IPCC in framing climate change problems. The politically sensitive issues of resource access and control are studiously avoided by these organizations (Kelly and Adger, 2000). The narrow framing of climate change vulnerability by the IPCC and UNFCC illustrates how science and politics are mutually constructed (Forstyh, 2003, pp. 143–144), and helps to explain why the conceptualization of adaptation as adjustment dominates the climate change literature.

In a similar vein, O’Brien et al. (2007) distinguish a “scientific framing” of climate change vulnerability from a “human security framing.” The former is associated with the impacts-driven or “end-point” interpretation of vulnerability while the latter is linked to the social structural interpretation of vulnerability, also known as the vulnerability-led or “starting point” perspective (Füssel and Klein, 2006; Kelly and Adger, 2000). These distinctive framings and associated discourses help account for the continuity in thinking and talking about hazard vulnerability and adaptation between the 1970s and today.

A growing commitment to pro-poor development planning may be a third area that is new (Brown, 2011; Pelling, 2011). A recurring theme in the climate change adaptation literature is that “development is the best form of adaptation” (Mearns and Norton, 2010, p. 30). Pro-poor development actions are seen as complementary to steps taken to reinforce adaptive capacity to climate change. Development actions can address multiple sources of vulnerability, ranging from those specific to climate change impacts to those that generate poverty and general insecurity (McGray et al., 2007). Given this broad-spectrum potential of development to address a range of societal ills, it is no wonder that pro-poor development is so popular. It is seen as a vehicle for creating “strong and accountable institutions, effective delivery of education and health care services, integrated water resources management, pro-poor agricultural research and extension, good infrastructure, and a diversified economy” (Mearns and Norton, 2010, p. 30). Success in achieving these “win-win” development-adaptation goals will depend on more than “good governance.” It will also hinge on the empowerment of the poor to restructure social, political, and economic relations in their favor. These political struggles will be key in reorienting “mainstream sustainable development” (Adams, 2008; Brown, 2011) to be pro-poor rather than business as usual.

5. Conclusion

The adaptation concept occupies a prominent place in the climate change literature, and its importance continues to grow. The number of chapters devoted to adaptation doubled between the 2007 and the forthcoming IPCC assessments, rising from three to six. Political economists more or less abandoned the concept some 30 years ago. But as it roars back onto the intellectual and policy landscapes, the concept now seems ripe for new consideration. This is not a call to political ecologists to hop on the adaptation bandwagon. Rather, it is a call to consider what all the commotion is about, and to perhaps affect the direction in which the wagon is moving. How we think and talk about adaptation matters to current and future debates on transformative climate action (Pelling, 2011; Ribot, 2011).

To conclude, we would like to make three brief points. The first is that there is much déja vu and a little bit of something new in the conceptualization of adaptation in the current climate change literature. This paper shows considerable continuity between the natural hazards debate of the 1970s/80s and the different interpretations of vulnerability and adaptation in the current climate change literature. Political economic views are also represented but to a much smaller extent. The dominance of the adjustment adaptation approach suggests that the politics of adaptation thinking are a ripe area for further research.

The second point is that how vulnerability is conceived will inevitably influence how adaptation is conceived. The contrasting explanations of vulnerability (starting point/end point;
vulnerability-led/impacts led; contextual/outcome) mean that adaptation policy will be framed by how risk and vulnerability are conceptualized. The dominance of the stimulus–response model of climate change adaptation has meant that the scope of adaptation thinking has been confined to very narrow parameters (O’Brien et al., 2007, p. 85).

Our third and final point is that political ecologists have much to contribute to current research on climate vulnerability and adaptation. First, there is considerable opportunity to advance understanding of how resource access, control and management mediate vulnerability and adaptation dynamics. The political ecology approach is particularly well suited to examining the multi-scale social, political, economic and ecological processes that shape vulnerabilities and opportunities to overcome adversity. Second, political ecologists are well placed to assess the application of sustainable development ideas in the climate change adaptation literature. The notions of “sustainable adaptation” (Yohé et al., 2007; Eriksen and Brown, 2011), “fair adaptation” (Adger, 2006), and “community-based adaptation” (Ayers and Forsyth, 2009) forge links between socio-economic development and vulnerability risk reduction. As Brown cautions though, there is a risk that “sustainable adaptation” will become an oxymoron “unless it specifically deals with fundamental problems in the dominant paradigm of unsustainable development” (Brown, 2011, p. 29). Political ecologists have productively tilled the conjoined fields of environment and development studies (Forsyth and Walker, 2008; Peet et al., 2011; Zimmerer and Bassett, 2003), and have much to contribute to the idea and practice of “sustainable adaptation.”

A third promising research area lies at the confluence of reformist and transformative adaptation approaches. While we agree with Pelling that incremental reforms can lead to transformation, it has rarely been demonstrated how this might happen. Adaptation is a long-term process. How can reformist steps lead to structural transformation? What does this process look like and what counts as transformative change? Is broad scale social vulnerability reduction the best indicator of transformation? What is the role of governance, institutions, and mainstreaming “development” in achieving this goal? If the main political economic argument is that one must re-order society to achieve vulnerability reduction, then what constitutes this re-ordering? Representation and accountability appear to be key reforms but do they result in greater equity and less environmental degradation? The failure of the World Trade Organization to reduce trade inequities (e.g. the Doha round of trade talks) speaks volumes about the obstacles that lie ahead for “building response capacity” and “managing climate risk.” For political ecologists working in the realm of environment–development studies, charting a way towards transformative adaptation via vulnerability analysis and risk reduction is a timely and important research agenda.

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